

## CLAIMS

### I Claim:

1. A substantially vertical cross-section of a fuselage for an airplane comprising:  
a first side of the cross-section having a first curvature; and  
a second side of the cross-section having a second curvature;  
wherein the first curvature is different from the second curvature.
2. The fuselage of claim 1 further comprising:  
a first width corresponding to the first side of the cross-section; and  
a second width corresponding to the second side of the cross-section.
3. The fuselage of claim 2 further comprising:  
a storage compartment coupled to the first side of the cross-section; and  
a seat inside the cross-section.
4. The fuselage of claim 3 further comprising an aisle in between the seat and the storage compartment.
5. The fuselage of claim 4 wherein the first curvature is an elliptical curve.
6. The fuselage of claim 4 wherein the second curvature is an elliptical curve.
7. The fuselage of claim 4 wherein the first curvature is a circular curve.
8. The fuselage of claim 4 wherein the second curvature is a circular curve.
9. The fuselage of claim 4 wherein the first curvature is a digitally specified curve.

10. The fuselage of claim 4 wherein the second curvature is a digitally specified curve.
11. The fuselage of claim 4 wherein the first curvature is a conic curve.
12. The fuselage of claim 4 wherein the second curvature is a conic curve.
13. The fuselage of claim 1 further comprising:  
an aisle inside of the cross-section; and  
a seat inside of the cross-section.
14. The fuselage of claim 13 wherein the seat is a business seat.
15. The fuselage of claim 1 wherein the fuselage is designed to travel at supersonic speed.
16. The fuselage of claim 15 wherein the fuselage is designed to travel over land with a reduced sonic boom signature.
17. The fuselage of claim 1 wherein the first curvature is a curvature selected from the group consisting of elliptical, conic, circular and digitally specified.
18. The fuselage of claim 17 wherein the second curvature is a curvature selected from the group consisting of elliptical, conic, circular and digitally specified.
19. The fuselage of claim 1 further comprising a fuselage height; wherein the cross-sectional area of the fuselage is reduced relative to the smallest circular cross-sectional area of a second fuselage with the same fuselage height.

20. The fuselage of claim 1 further comprising a aisle height; wherein the cross-sectional area of the fuselage is reduced relative to the smallest circular cross-sectional area of a second fuselage with the same aisle height.

21. The fuselage of claim 1 wherein the cross-sectional area of the fuselage is reduced relative to the cross-sectional area of a second fuselage with each half having two equal curvatures.

22. The fuselage of claim 1 further comprising:  
a height;  
a first width corresponding to the first curvature; and  
a second width corresponding to the second curvature.

23. The fuselage of claim 22 wherein the cross-sectional area of the fuselage is reduced relative to the smallest elliptical cross-sectional area of a second fuselage having a second fuselage height equal the height and a second fuselage width of double the greater of the first width and the second width.

24. The fuselage of claim 1 further comprising:  
a height;  
a first width corresponding to the first curvature; and  
a second width corresponding to the second curvature;  
wherein the height is greater than the sum of the first width and the second width.

25. The fuselage of claim 24 wherein the first width is less than the second width.

26. A cross section of an airplane comprising:  
a first side of a fuselage with a first curvature;

a second side of the fuselage with a second curvature which is coupled to the first side of the fuselage;  
a storage compartment within the fuselage;  
a seat within the fuselage; and  
an aisle within the fuselage;  
wherein the first curvature is different from the second curvature.

27. The cross section of the airplane of claim 26 wherein the aisle is between the seat and the storage compartment.

28. The cross section of the airplane of claim 26 further comprising:  
a first width corresponding to the first side of the fuselage; and  
a second width corresponding to the second side of the fuselage.

29. The cross section of the airplane of claim 28  
wherein the first curvature is an elliptical curvature;  
wherein the second curvature is an elliptical curvature; and  
wherein the second width is greater than the first width.

30. The cross section of the airplane of claim 29  
wherein the first width is between 20 and 30 inches; and  
wherein the second width is between 37.65 and 47.65 inches.

31. The cross section of the airplane of claim 30  
wherein the fuselage has a height of between 87 and 97 inches;  
wherein the cross sectional area of the fuselage is between 4650 and 5150 square inches.

32. The cross section of the airplane of claim 26 wherein the first curvature is an elliptical curve.

33. The cross section of the airplane of claim 26 wherein the second curvature is an elliptical curve.

34. The cross section of the airplane of claim 26 wherein the first curvature is a circular curve.

35. The cross section of the airplane of claim 26 wherein the second curvature is a circular curve.

36. The cross section of the airplane of claim 26 wherein the first curvature is a digitally specified curve.

37. The cross section of the airplane of claim 26 wherein the second curvature is a digitally specified curve.

38. The cross section of the airplane of claim 26 wherein the first curvature is a conic curve.

39. The cross section of the airplane of claim 26 wherein the second curvature is a conic curve.

40. The cross section of the airplane of claim 26 wherein the storage compartment and the seat are on the same side of the aisle.

41. The cross section of the airplane of claim 26 wherein the seat is a business seat.

42. The cross section of the airplane of claim 26 wherein the seat is a first class seat.

43. The cross section of the airplane of claim 26 wherein the seat is a economy class seat.

44. The cross section of the airplane of claim 26 further comprising a widow in the fuselage.

45. The cross section of the airplane of claim 26 further comprising a door in the fuselage.

46. The cross section of the airplane of claim 26 further comprising a fuselage height corresponding to the first side of the fuselage and the second side of the fuselage;

wherein the cross sectional area of the fuselage is reduced relative to the smallest circular cross-sectional area of a second fuselage with the same fuselage height.

47. The cross section of the airplane of claim 46 wherein the sonic boom signature of the fuselage has been reduced relative to the sonic boom signature of the second fuselage.

48. The cross section of the airplane of claim 26 further comprising a fuselage height corresponding to the first side of the fuselage and the second side of the fuselage;

wherein the cross sectional area of the fuselage is reduced relative to the smallest circular cross-sectional area of a second fuselage with the same fuselage height.

49. The cross section of the airplane of claim 47 wherein the sonic boom signature of the fuselage has been reduced relative to the sonic boom signature of the second fuselage.

50. The fuselage of claim 26 wherein the cross-sectional area of the fuselage is reduced relative to the cross-sectional area of a second fuselage with each half of the second fuselage having two equal cross-sectional curvatures.

51. The fuselage of claim 50 wherein the sonic boom signature of the fuselage has been reduced relative to the sonic boom signature of the second fuselage.

52. A method of minimizing a sonic boom signature of an airplane comprising:  
determining a plurality of contents which will be located in a cross-sectional area of a fuselage;  
determining the placement of the plurality of contents which will be located in the cross-sectional area of the fuselage; and  
reducing the cross-sectional area of the fuselage such that a sonic boom signature of the airplane is substantially reduced.

53. The method of claim 52 further comprising:  
determining a first curvature for a first side of the fuselage; and  
determining a second curvature for the second side of the fuselage;  
wherein the first curvature is different from the second curvature.

54. The method of claim 53 wherein:  
the first curvature is an elliptical curve; and  
the second curvature is an elliptical curve.

55. The method of claim 52 wherein one of the plurality of contents comprises a business class seat.

56. The method of claim 52 wherein one of the plurality of contents comprises a first class seat.

57. The method of claim 52 wherein one of the plurality of contents comprises a seat having a seat-bottom width of at least 18 inches.

58. The method of claim 52 wherein the cross-sectional area of the fuselage has a symmetrical cross-section at some longitudinal location of said airplane.

59. The method of claim 52 wherein the cross-sectional area of the fuselage has an asymmetrical cross-section.

60. The method of claim 59 wherein a second cross sectional area of the fuselage has a symmetrical cross section.

61. The method of claim 52 wherein one of the plurality of contents comprises an aisle having a height of at least 60 inches.

62. The method of claim 52 wherein the plurality of contents includes a seat and an aisle;  
wherein the space envelope of the aisle is taller than the single seat;  
wherein the placement of the plurality of contents comprises placing the seat substantially adjacent to the aisle; and  
wherein the reducing the cross-sectional area comprises defining a fuselage asymmetric cross-sectional shape that envelopes both the seat and the aisle and that has a cross-sectional area that is less than the area of the smallest area circle that envelopes the seat and the aisle.

63. The method of claim 52 wherein the plurality of contents includes a seat and an aisle;  
wherein the space envelope of the aisle is taller than the seat;  
wherein the placement of the plurality of contents comprises placing the seat substantially adjacent to the aisle; and



wherein the reducing the cross-sectional area comprises defining a fuselage asymmetric cross-sectional shape that envelopes both the seat and the aisle and that has a cross-sectional area that is less than the area of the smallest area ellipse that envelopes the seat and the aisle.